	Centre Number	Candidate Number
Candidate Name _____		

International General Certificate of Secondary Education
UNIVERSITY OF CAMBRIDGE LOCAL EXAMINATIONS SYNDICATE

PHYSICS 0625/2

PAPER 2

Friday **12 NOVEMBER 1999** Morning 1 hour

Candidates answer on the question paper.
Additional materials:
Electronic calculator and/or Mathematical tables
300 mm ruler

TIME 1 hour

INSTRUCTIONS TO CANDIDATES

Write your name, Centre number and candidate number in the spaces at the top of this page.
Answer **all** questions.
Write your answers in the spaces provided on the question paper.

INFORMATION FOR CANDIDATES

The number of marks is given in brackets [ ] at the end of each question or part question.
You may lose marks if you do not show your working or if you do not use appropriate units.
Take the weight of 1 kg to be 10 N (i.e. acceleration of free fall = 10 m/s^2).

FOR EXAMINER'S USE

This question paper consists of 15 printed pages and 1 blank page.

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[Turn over

1 A small tank contains water of depth 2 cm, as shown in Fig. 1.1.

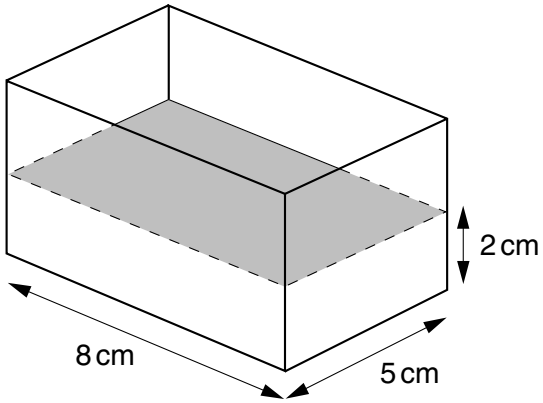

Fig. 1.1

(a) Show that the volume of water in the tank is 80 cm^3.

[3]

(b) The water is poured into the measuring cylinder shown in Fig. 1.2. On Fig. 1.2, mark the level of the water surface in the measuring cylinder when this has been done. [1]

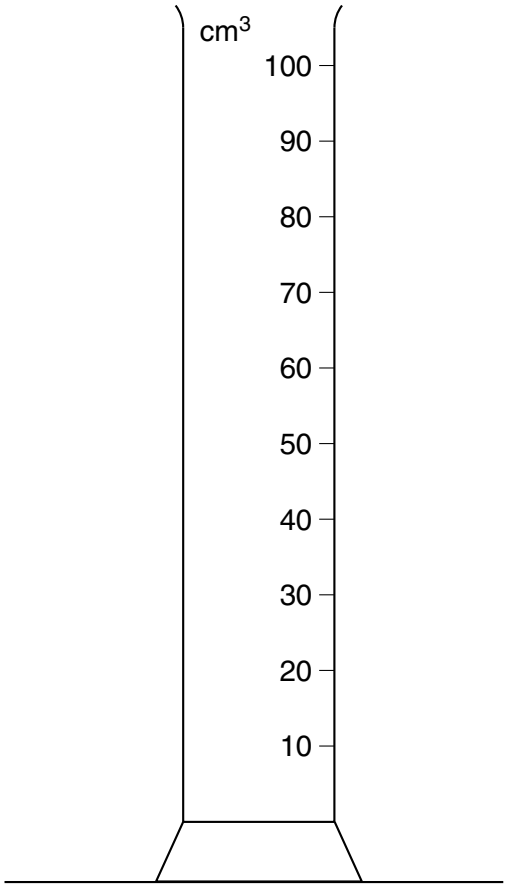

Fig. 1.2

2 When the cardboard shape in Fig. 2.1 is freely hung from A, line AX is vertical.

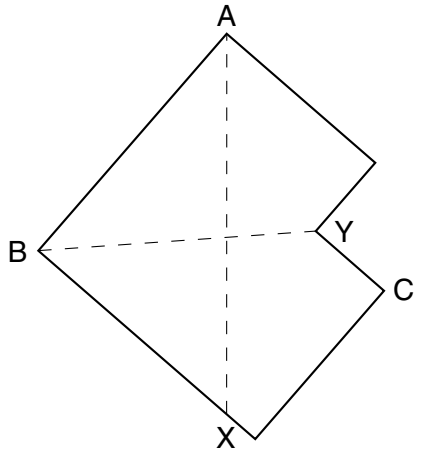

Fig. 2.1

When it is freely hung from B, line BY is vertical.

(a) On Fig. 2.1, mark the position of the centre of mass of the shape, using a clear dot (•). [1]

(b) On Fig. 2.1, draw a line through C which would be vertical if the shape were to be freely hung from C. [1]

3 Magnet A is put on a smooth (frictionless) horizontal table, as shown in Fig. 3.1.

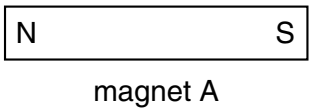

Fig. 3.1

(a) A second magnet is moved towards magnet A, as shown in Fig. 3.2.

Fig. 3.2

What happens to magnet A?

..... [1]

(b) Magnet C is now moved towards magnet A, as shown in Fig. 3.3.

Fig. 3.3

What happens to magnet A?

..... [1]

(c) An iron bar is moved towards magnet A, as shown in in Fig. 3.4.

Fig. 3.4

What happens to magnet A?

..... [1]

(d) A plastic rod is moved towards magnet A, as shown in Fig. 3.5.

Fig. 3.5

What happens to magnet A?

..... [1]

4 A person walks from A to E, a journey which goes over the top of the hill BCD, as shown in in Fig. 4.1.

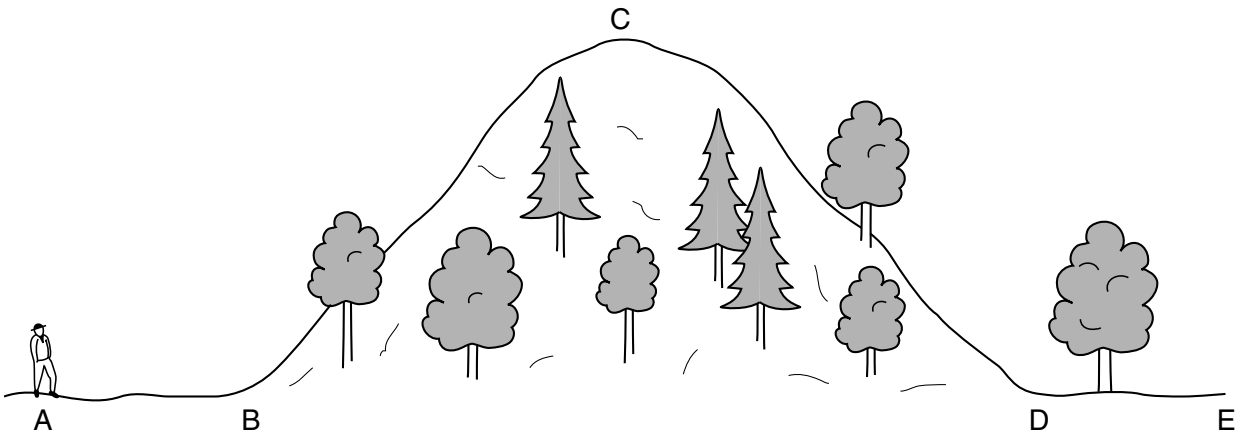

Fig. 4.1

(a) (i) During which part of the walk does the person do most work? Tick one box.

AB ☐

BC ☐

CD ☐

DE ☐

(ii) Explain your answer to **(a)(i)**.

.....

.....

[2]

(b) (i) The person now runs over the hill from A to E. How does the average power developed by the person compare with that when the person walked? Tick one box.

greater than when walking ☐

same as when walking ☐

less than when walking ☐

(ii) Explain your answer to **(b)(i)**.

.....

.....

[3]

5 Fig. 5.1 shows a battery, a switch and a bell connected so that the bell rings when the switch is pushed.

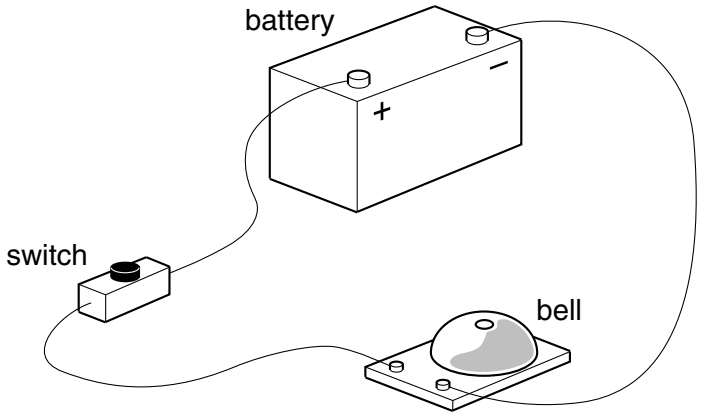

Fig. 5.1

(a) Draw the circuit diagram for this arrangement. Use standard circuit symbols.

[3]

(b) A second bell is now connected in parallel with the first bell.

(i) Copy your circuit diagram from **(a)** and add the second bell.

(ii) Why will the battery run out more quickly when the switch has been pushed?

.....

.....

[2]

6 A ray of yellow light enters a rectangular glass block at A and leaves it at B, as shown in Fig. 6.1.

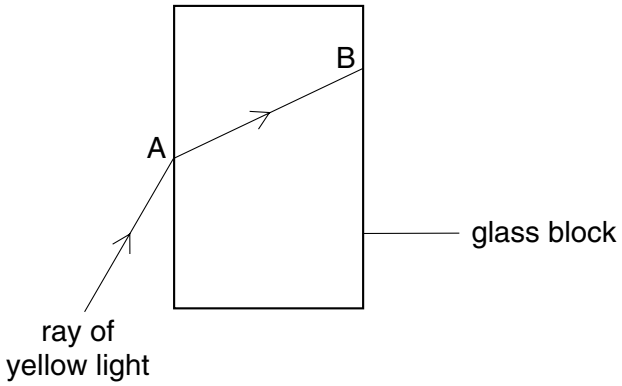

Fig. 6.1

(a) At A on Fig. 6.1,

(i) draw the normal,

(ii) mark carefully and label clearly the angle of incidence *i* and the angle of refraction *r*. [3]

(b) At B on Fig. 6.1, draw carefully the ray of light which emerges from the glass block. [2]

7 Fig. 7.1 shows an electric kettle.

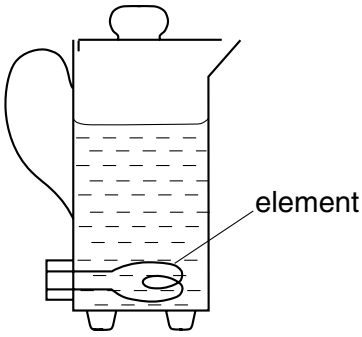

Fig. 7.1

Explain why the heating element is placed near the bottom of the kettle.

.....

.....

..... [2]

8 Describe the structure of an atom in terms of its nucleus and electrons. Do not mention protons or neutrons.

.....

.....

.....

.....

.....

..... [3]

9 **(a)** Light from an illuminated slit passes through two lenses A and B and forms a focused image on a screen, as shown in Fig. 9.1.

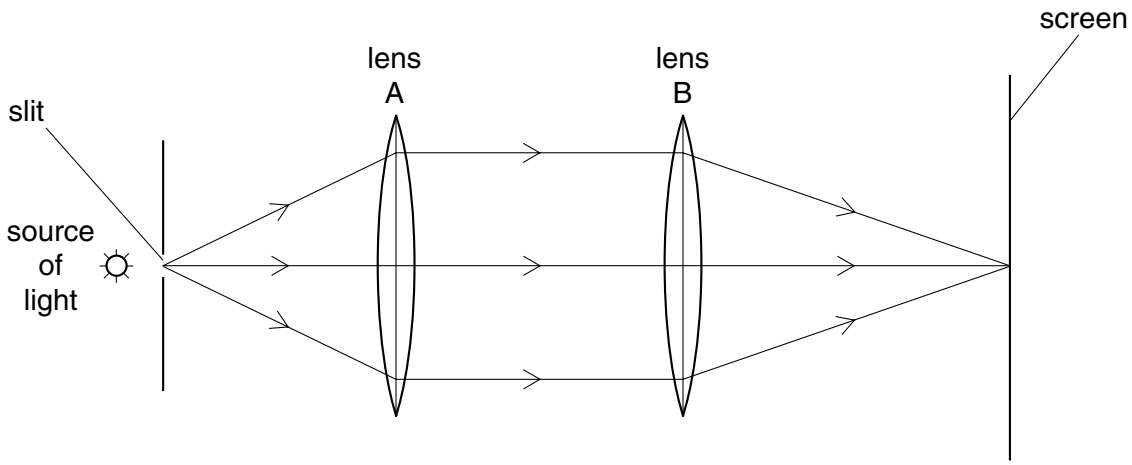

Fig. 9.1

On Fig. 9.1, indicate clearly

(i) the focal length of lens A, using the symbol f_A,

(ii) the focal length of lens B, using the symbol f_B.

[4]

(b) In Fig. 9.2, O is an object placed with its base on the axis of a lens, and PF is the focal length of the lens.

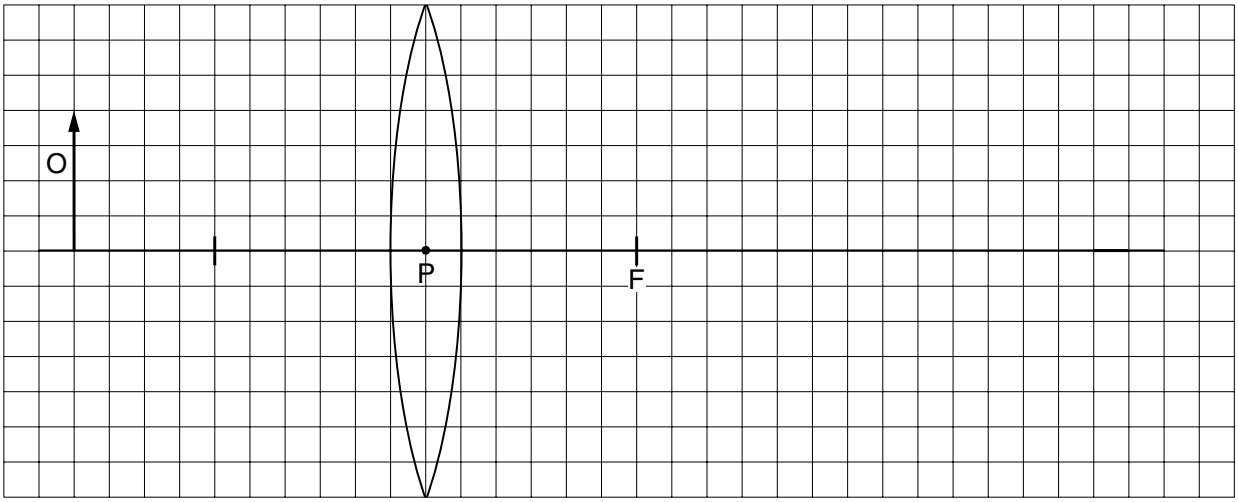

Fig. 9.2

(i) Use your rule to draw two rays from the top of the object, through the lens, which meet at the top of the image. [5]

(ii) Draw in the image, and label it I. [1]

(iii) Put ticks in the boxes alongside the statements which correctly describe your image.

real	☐
upright	☐
inverted	☐
larger than object	☐
smaller than object	☐
same size as object	☐

[3]

10 (a) Fig. 10.1 shows the structure of a simple transformer.

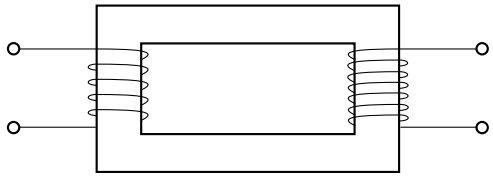

Fig. 10.1

On Fig. 10.1, label the important components of the transformer. [5]

(b) Explain why the coils of a transformer are made of copper, rather than some other metal.

.....

..... [1]

(c) A transformer has 500 turns in its primary coil, and 1500 turns in its secondary coil. Energy losses from the transformer are so small that they may be neglected.

(i) Use the equation $\frac{V_s}{V_p} = \frac{N_s}{N_p}$ to calculate the potential difference across the secondary coil when an alternating potential difference of 10 V is supplied to the primary coil.

(ii) State the value of the potential difference across the secondary coil when a steady (d.c.) potential difference of 10 V is supplied to the primary coil.

.....
[4]

(d) Another transformer has the same number of turns on its primary coil as it has on its secondary coil. An alternating potential difference is supplied across the primary coil. State the size of the output potential difference compared with the input potential difference.

..... [1]

11 (a) In the table below, write two different physical properties which may be used to measure temperature. An example has been given to help you.

The change in volume	OF	a liquid
	OF	
	OF	

[4]

(b) When creating a temperature scale, fixed points are needed.

Explain what is meant by a *fixed point*.

.....

.....

..... [2]

(c) In the table below, state the upper and lower fixed points used when calibrating a liquid-in-glass thermometer with a centigrade temperature scale.

THE UPPER FIXED POINT IS THE TEMPERATURE OF	ITS VALUE IS
THE LOWER FIXED POINT IS THE TEMPERATURE OF	ITS VALUE IS

[5]

(d) Fig. 11.1 shows how the temperature changes with time for a substance as it is heated steadily from a solid to a liquid and then to a gas.

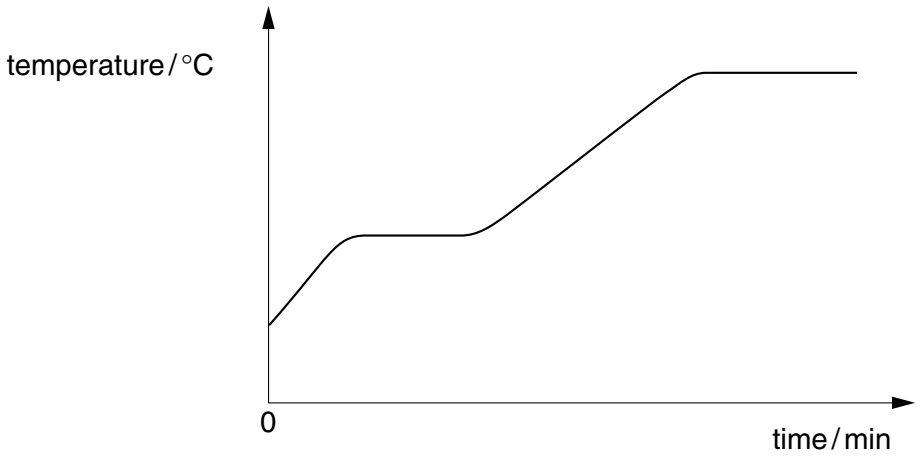

Fig. 11.1

On Fig. 11.1,

(i) label the melting point and the boiling point of the substance,

(ii) indicate the time when the substance is completely liquid.

[3]

12 A football is inflated by pumping air into it.

(a) Describe the behaviour of an air molecule in the middle of the football.

.....

..... [3]

(b) Using a diagram, describe the behaviour of the molecule near the inside surface of the football.

.....

..... [2]

(c) Use your answer to explain how air molecules create the pressure on the inside of the football.

.....

.....

..... [4]

(d) When the football is left in the Sun's rays, it gets hot. Describe what happens to the air molecules, and how this affects the pressure of the football.

.....

.....

..... [3]

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